Visibility as a lever of collaboration: Implications to designing collaborative spaces

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Extended Abstract

Previous research has emphasized collaboration in formal organization settings. Commonly reported issues of collaboration in such settings include: organizational interdependence (Thomson, 1967), inter-organizational exchange (Cook, 1977), necessity, reciprocity, legitimacy, stability, and efficiency of parties that enter into collaboration (Oliver,1990), and coordination (Malone & Crowston, 1994). In such collaboration, parties are often bound with formally defined rules and responsibilities. Because of the formal nature of the collaborative endeavor, those entering into the collaboration need to focus as much on what they are obligated to do as on what they can create or do. Despite research efforts, in practice, we still continue to encounter stringent challenges in managing many collaborative enterprises.

On the other hand, recently, we are beginning to see a radically different model of collaboration. This new model has been variously called as social-production (Benkler, 2006), volunteered information (Goodchild, 2007), and crowdsourcing (Howe, 2008), where individuals, loosely formed groups and organizations collaborate without formal mandates. This is especially evident in the use of web 2.0 based tools. In this paper, we begin by asking a question: What drives people to engage in this new model of collaboration and what lessons can we learn from it? Based on our study of a collaborative online mapping community called OpenStreetMap (www.openstreetmap.org) and middle school students' collaborative mapping of a cemetery in Illinois, we discover that 'visibility' of the shared goal, a participant's contribution, and how much more contribution is still required to accomplish the goal is a crucial factor in the degree of participation in a collaborative endeavor.

In the case of OpenStreetMap, we analyzed 2846 conversation messages qualitatively using grounded theory (Glasser & Strauss, 1967), and in particular constructivist grounded theory (Charmaz, 1983). Although the analysis suggests different factors, we find that 'visibility',

particularly in the form of maps, plays a crucial role in the motivation to achieve a shared goal and hence acts as a lever of collaboration. Maps, by their very nature, are effective communication and visualization tools, and hence appeal to members of a community to contribute in two distinct ways: First, when one sees a contribution appear visually in maps, it provides a deep satisfaction that enhances the inquiry cycle. Second, seeing a blank area in a map accentuates the instrumentality of the contributions, leading the participant to map that area.

In the case of the cemetery mapping project, one of the authors spent several hours observing a group of six middle school students while they mapped people's gravestones using Google map in an after-school program. At the beginning of the project, students spent several weeks in library research and each identifying a few people, mostly from the 18th century, for further study. They then went to the cemetery, where they recorded the locations of gravestones using GPS, and captured pictures and videos using digital cameras. For the lab work that followed the field work, they created a Google map, which acted as a shared mapping space, in which each student could map gravestones on the same map. We used the inquiry-based cycle of ask-investigate-create-discuss-reflect as a framework in this project (Bruce & Bishop, 2002; Bruce, 2009).

The mapping activities extended several hours. Unsurprisingly, different students had different mapping skill levels. Because students could immediately see the push-pin once they marked each gravestone on Google map, this immediate visibility of their work motivated them to map other gravestones and improve different aspects of the map. When students who were lagging behind their peers saw that the gravestones they were interested were not mapped, they were immensely motivated to map them. When they saw the map of stones mapped by other students, they got a sense of how the map would look once it was mapped. In addition, there was a bit of competition with peers; they did not want their efficacy to be questioned. Whatever the underlying reasons were, they were all triggered by the visibility. Thus, it played important roles to motivate collaborators, which are strikingly similar to what we discovered in our earlier case.

Based on our study, we conclude that 'pleasure of creation' and 'instrumentality' of one's contribution motivate humans to participate in collaborative works. Visibility plays a significant role in one's decision to take part and provide sustained contribution in a collaborative enterprise. The notion of 'visibility' proposed here relates to Erickson & Kellog's (2000) discussion of spatial constructs—visibility, awareness and accountability—in the design of collaborative information systems. One major difference, however, is that we emphasize visibility in terms of contributions, rather than simply the visibility of participants' spatial locations and proximity. Clearly mapping the visibility of the goal, how much one has already contributed, how much others have contributed, and what additional contributions are needed in order to accomplish the goal is worth considering in designing collaborative spaces.

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